



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,470	04/06/2005	Shiro Ikeda	CU-4144 BWH	4887
26530	7590	04/27/2006	EXAMINER	
LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1600 CHICAGO, IL 60604			KIM, SUN U	
			ART UNIT	PAPER NUMBER
			1723	

DATE MAILED: 04/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/530,470

Applicant(s)

IKEDA ET AL.

Examiner

John Kim

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 8-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 8-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>4/6/05 &amp; 12/22/05</u> . | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1723

1. A substitute specification excluding the claims is required pursuant to 37 CFR 1.125(a) because several pages of the specification has words without spaces between them which makes hard to read.

A substitute specification must not contain new matter. The substitute specification must be submitted with markings showing all the changes relative to the immediate prior version of the specification of record. The text of any added subject matter must be shown by underlining the added text. The text of any deleted matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived. An accompanying clean version (without markings) and a statement that the substitute specification contains no new matter must also be supplied. Numbering the paragraphs of the specification of record is not considered a change that must be shown.

2. Figures 6-7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are

Art Unit: 1723

canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 6-9 in preliminary amendment filed 4/6/05 have been renumbered claims 8-11. Original claims 6-7 have been canceled.

4. Claim 2 is objected to because of the following informalities: Recitation of “a remaining flows” on line 12 should be corrected to “a remaining fluid flows”. Appropriate correction is required.

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 2-3 and 8-11 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. “A first cover having an inlet and a second cover having an outlet” for claim 2 and “a first chamber having an inlet and a second chamber having an outlet” for claim 3 are critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Without “a first cover having an inlet and a second cover having an outlet” in claim 2 and “a first chamber having an inlet and a second chamber having an outlet” in claim 3, the claimed separation module would not work since no inlet for flowing fluid to the shell and no outlet for membrane permeable fluid or non-permeable fluid to flow out are provided.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1723

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

8. Claims 1-3 are rejected under 35 U.S.C. 102(a) as being anticipated by European patent Application No. 1 127 606 A1 (hereinafter referred to as EP '606). EP '606 teaches a multiple tube type separation membrane module comprising a plurality of tubular separation membrane elements (9) having sealed ends and open ends, outside tubes (12) surrounding the tubular separation membrane elements (9) with spaces formed therebetween and having first openings on the sealed ends side of the tubular separation membrane elements (9) as well as having second openings in the vicinities of the open ends of the tubular separation membrane elements, inlet means communicating with the first openings of the outside tubes, first outlet means communicating with the open ends of the tubular separation membrane elements (9) and second outlet means communicating with the second openings of the outside tubes wherein compartment (7) has an inlet means and compartment (8) has the first outlet means and compartment (11) has second outlet means and the tubular separation membrane elements (9) comprises hollow ceramic tubes with a zeolite membrane (see paragraph 0024-0025) having fine pores approximately as large as the molecules of a substance to be separated (see figure 1; paragraphs 0038-0043)(claim 1). Recitation of “wherein a fluid flowing from the first openings of the outside tubes through the inlet means flows in the spaces between the tubular separation membrane elements and the outside tubes, a component separated from the fluid by the tubular separation membrane elements flows out from the first outlet means through the open ends of the tubular separation membrane elements, and a remaining fluid flows out from the second outlet means” is an intended use and are not given patentable weight in apparatus claims. It has been

Art Unit: 1723

held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987). Regarding claim 2, EP '606 further teaches a multiple tube type separation membrane module comprising a shell (4) having an outlet (29), a first support plate (5) fixed to an end of the shell (4), a second support plate (6) fixed to the other end of the shell, a plurality of outside tubes (12) supported by the first and second support plates (5, 6) and extending in the lengthwise direction of the shell, tubular separation membrane elements (9) disposed in the outside tubes (12), a first cover (2) attached to the first support plate (5) and a second cover (3) attached to the second support plate (6) wherein the outside tubes (12) have first openings formed on the first cover side (2) and second openings formed on the second cover side (3), the tubular separation membrane elements (9) have sealed ends on the first cover side as well as have open ends on the second cover side, and the spaces between the outside tubes (12) and the tubular separation membrane elements (9) are opened on the first cover side and sealed on the second cover side and the tubular separation membrane elements (9) comprise hollow ceramic tubes with a zeolite membrane (see paragraph 0024-0025) having fine pores approximately as large as the molecules of a substance to be separated (see figure 1; paragraphs 0038-0043). Recitation of "thereby a component, which is separated by the tubular separation membrane elements from the fluid flowing from the first openings of the outside tubes into the spaces between the outside tubes and the tubular separation membrane elements, flows out into the second cover from the open ends of the tubular separation membrane elements, and the remaining fluid flows out from the outlet of the shell through the second openings" is an intended use and are not given patentable weight in apparatus claims. It has been

Art Unit: 1723

held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987). Regarding claim 3, EP '606 teaches that the first cover (2) has a partition in the middle of the first cover (2) forming a first compartment (7) and a second compartment (8) (see figure 1). Recitation of "wherein a fluid flowed into the first chamber passes through the spaces between the outside tubes having first openings in the first chamber and the tubular separation membrane elements, flows out from the second openings of the outside tubes, flows into the outside tubes having first openings in the second chamber from the second openings, passes through the spaces between the outside tubes and the tubular separation membrane elements, and flows into the second chamber" is an intended use and are not given patentable weight in apparatus claims. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

Art Unit: 1723

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 4, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '606. EP '606 teaches a multiple tube type separation module as described in above paragraph 8. Claims 4, 8 and 10 essentially differ from the module of EP '606 in reciting that the inside diameter of the outside tubes is 1.1 to 2 times the outside diameter of the tubular separation membrane elements. EP '606 further teaches that the dimension of the annulus gap between the tubular membrane and the outside tubes e.g. feed tube can be changed and adjusted by changing the inner diameter of the outside tubes or the outer diameter of the tubular membrane so that the flow of the mixture to be separated can be directed fully tangential over the outside surface of the tubular membrane and any value of the Reynolds number of the feed mixture to be separated can be reached (see paragraph 0021). It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the inside diameter of the outside tubes in relation to the outside diameter of the tubular separation membrane elements to achieve desired flow rate and the desired value of the Reynold number of the feed mixture to be separated as disclosed in EP '606, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

12. Claims 5, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '606 as applied to claims 1-3 above, and further in view of US Patent No. 3,774,771 (Manjikian et al). EP '606 teaches a multiple tube type separation module as described in above paragraph



Art Unit: 1723

8. Claims 5, 9 and 11 essentially differ from the module of EP '606 in reciting that the sealed ends of the tubular membrane elements are fixed in the outside tubes while keeping spaces by pins disposed on any one of the outside tubes and the sealed ends. Manjikian et al teach a multiple tube type separation module comprising a spacer (60) at the sealed ends of a tubular separation membrane (48) on a cylindrical support tube (50) wherein the spacer (60) keeps the membrane (48) centrally aligned in its flow tube (26) i.e. outside tube and thus the membrane element (48) and its surrounding tube (26) will be concentric and this will result in the membrane surface of each membrane element and the interior surface of its surrounding flow tube being spaced apart a substantially uniform distance (see figures 1-3, 6; col. 4, lines 16-31). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a spacer or a similar structure such as pin at the seal ends of the tubular membrane of EP '606 to keep the membrane surface of each membrane element and the interior surface of its surrounding flow tube being spaced apart a substantially uniform distance as suggested by Manjikian et al.

13. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over UK patent Application No. 2 011 796 A (hereinafter referred to as UK '796) in view of EP '606. UK '796 teaches a multiple tube type separation membrane module comprising a plurality of tubular separation membrane elements (9) having sealed ends and open ends, outside tubes (8) surrounding the tubular separation membrane elements (9) with spaces formed therebetween and having first openings on the sealed ends side of the tubular separation membrane elements (9) as well as having second openings in the vicinities of the open ends of the tubular separation membrane elements, inlet means (13) communicating with the first openings of the outside

Art Unit: 1723

tubes, first outlet means (14) communicating with the open ends of the tubular separation membrane elements (9) and second outlet means (22) communicating with the second openings of the outside tubes (see figure 1; page 3, lines 18-106). Recitation of "wherein a fluid flowing from the first openings of the outside tubes through the inlet means flows in the spaces between the tubular separation membrane elements and the outside tubes, a component separated from the fluid by the tubular separation membrane elements flows out from the first outlet means through the open ends of the tubular separation membrane elements, and a remaining fluid flows out from the second outlet means" is an intended use and are not given patentable weight in apparatus claims. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Claim 1 essentially differs from the module of UK '796 in reciting a hollow ceramic tubes with a zeolite membrane having fine pores approximately as large as the molecules of a substance to be separated. UK '796 teaches that the tubular filter elements are made of ceramic material and or as a support for a solid coating of filter material to separate out particles (see page 1, lines 3-31). EP '606 teaches a tubular membrane made of zeolite (see paragraphs 0023-0024). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to substitute known equivalent zeolite filtering membrane for ceramic membrane in the module of UK '796 for membrane filtration.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent No. 3,491,021 and 3,672,509 teach membrane modules with pin or strut.

Art Unit: 1723

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kim whose telephone number is 571-272-1142. The examiner can normally be reached on Monday-Friday 7 a.m. - 3:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Kim can be reached on 571-272-1142. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



John Kim  
Primary Examiner  
Art Unit 1723

JK  
April 25, 2006